This document provides pertinent information concerning the issuance of the VPDES Permit listed below. This permit is being processed as a Minor, Municipal permit. The discharge results from the operation of a tiered 0.0045 MGD and 0.009 MGD wastewater treatment plant. This permit action consists of proposing effluent limits to reflect the current Virginia Water Quality Standards (effective January 6, 2011). The effluent limitations and special conditions contained within this permit will maintain the Water Quality Standards of 9VAC25-260 et seq.

1.	Facility Name and Mailing Address:	Loudoun County Milling Company Wastewater Treatment Plant 18074 Harmony Church Rd., Hamilton, VA 20158	SIC Code:	4952 WWTP
	Facility Location:	39098 Irene Rd., Hamilton, VA 20158	County:	Loudoun
	Facility Contact Name:	Eric Zicht	Telephone Number:	(540) 882-4266
	Facility Email Address:	zicht@erols.com		
2.	Permit No.:	VA0092924	Expiration Date:	Not Applicable
	Other VPDES Permits:	VAN010174		
	Other Permits:	Air Registration #70551, Tank ID #3002545, Remediation Site PC20003352		
	E2/E3/E4 Status:	Not Applicable		
3.	Owner Name:	Loudoun County Milling Company		
	Owner Contact / Title:	Joseph M. Rogers, Jr. / Owner	Telephone Number:	(540) 338-7161
	Owner Email Address:	LCMILLINGCO@aol.com		
4.	Application Complete Date:	May 23, 2016		
	Permit Drafted By:	Caitlin Shipman	Date Drafted:	August 5, 2016
	Draft Permit Reviewed By:	Douglas Frasier	Date Reviewed:	August 8, 2016
	Draft Permit Reviewed By:	Alison Thompson	Date Reviewed:	August 16, 2016
	Public Comment Period :	Start Date:	End Date:	
5.	Receiving Waters Information:	See **Attachment 1** for the Flow Frequency Determination.		
	Receiving Stream Name:	South Fork Catoctin Creek, UT	Stream Code:	1aXOK
	Drainage Area at Outfall:	0.40 square miles	River Mile:	0.06
	Stream Basin:	Potomac	Subbasin:	Middle Potomac - Catoctin
	Section:	10b	Stream Class:	III
	Special Standards:	None	Waterbody ID:	VAN-A02R; PL02
	7Q10 Low Flow:	0.0 MGD*	7Q10 High Flow:	0.014 MGD
	1Q10 Low Flow:	0.0 MGD*	1Q10 High Flow:	0.002 MGD
	30Q10 Low Flow:	0.0 MGD*	30Q10 High Flow:	0.035 MGD
	Harmonic Mean Flow:	0.032 MGD	30Q5 Flow:	0.008 MGD

*It is staff's professional judgement that when a drainage area is 5 square miles or less, critical low flows will be equal to 0.0 MGD.

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

X	State Water Control Law	**X**	EPA Guidelines
X	Clean Water Act	**X**	Water Quality Standards
X	VPDES Permit Regulation	**X**	9VAC25-40
X	EPA NPDES Regulation		Other (PES, Occoquan Policy, Dulles)

7. Licensed Operator Requirements: Class III

8. Reliability Class: Class II

9. Facility / Permit Characterization:

X	Private	X	Effluent Limited		Possible Interstate Effect
	Federal	X	Water Quality Limited		Compliance Schedule
	State		Whole Effluent Toxicity Program		Interim Limits in Permit
	POTW		Pretreatment Program		Interim Limits in Other Document
	eDMR Participant	X	Total Maximum Daily Load (TMDL)		

10. Wastewater Sources and Treatment Description:

Loudoun Milling Company is a multi-purpose commercial development. Currently, the property includes a building supply store, animal feed store, and a convenience store. There are future plans to include a restaurant on the property. The wastewater treatment plant is replacing a septic field and will allow for future growth and expansion of the property.

This facility is unbuilt. The permittee intends to have one 0.0045 MGD train with plans to add a second, identical 0.0045 MGD train at a later date. Influent will flow through a flow splitter and be divided between the two trains. In each train, flow will go through a trash tank and then into a flow equalization tank. Influent in the equalization tank will be aerated and undergo alkalinity adjustment.

Influent will then flow through three moving bed biofilm reactor (MBBR) chambers. The first MBBR chamber will be anoxic, followed by an aerobic chamber with aeration, and then another anoxic chamber. A carbon feed and coagulation feed will be attached to the third MBBR. The influent will then undergo membrane filtration, UV disinfection, final aeration, and then will be discharged.

Sludge from the trash tank and the membrane filtration will be wasted to the sludge digester. The sludge digester will be aerated; decanted water from the sludge digester will be returned to the trash tank.

The Certificate to Construct has not been issued.

See **Attachment 2** for a facility schematic/diagram.

TABLE 1
OUTFALL DESCRIPTION

Number	Discharge Sources	Treatment	Design Flow	Latitude / Longitude
001	Domestic Wastewater	See Section 10	Tiered: 0.0045 MGD, 0.009 MGD	39° 08′ 33″ 77° 38′ 55.6″
See **Attachment 3** for the 215B – Purcellville topographic map.				

11. Sludge Treatment and Disposal Methods:

Digested sludge will be transported via a permitted waste hauler to Broad Run Water Reclamation Facility (VA0091383).

12. Permitted Facilities Located Within Waterbody PL02:

TABLE 2 PERMITTED DISCHARGES LOCATED WITHIN WATERBODY PL)2			
ID / Permit Number	Facility Name	Type	Receiving Stream
VA0060500	Waterford Sewage Treatment Plant	VPDES Individual	South Fork Catoctin Creek
VA0089940	Purcellville Town Water Treatment Plant	VPDES Individual	
VAG406539	Price David Residence	Small Municipals <1,000 GPD	North Fork Catoctin Creek
VAG406103	Biraben Roger Residence		North Fork Catoctin Creek, UT
VAG406477	Hillsboro Pub		
VAG110121	Virginia Concrete Company Inc. - Purcellville	Concrete	South Fork Catoctin Creek
1aSOC000.01	DEQ Monitoring Stations	Biological	South Fork Catoctin Creek above the confluence with North Fork Catoctin Creek
1aSOC001.66		Ambient	South Fork Catoctin Creek at Route 698
1aSOC005.46			South Fork Catoctin Creek at Route 9

13. Material Storage:

This facility is unbuilt; no materials are currently stored on site.

14. Site Inspection:

DEQ-NRO water permitting staff, Caitlin Shipman and Douglas Frasier, and DEQ-NRO water compliance staff, Lisa Janovsky, visited the proposed site on May 10, 2016. See **Attachment 4** for the memo from the site visit.

15. Receiving Stream Water Quality and Water Quality Standards:

a. Ambient Water Quality Data

This facility discharges to an unnamed tributary (streamcode XOK) to unnamed tributary (streamcode XOJ) to unnamed tributary (streamcode XBL) to South Fork Catoctin Creek; streamcode XOK has been neither monitored nor assessed. The nearest downstream DEQ ambient monitoring station is 1ASOC005.46, which is located on South Fork Catoctin Creek approximately 2.3 miles downstream from Outfall 001. The following is the water quality summary for this segment of South Fork Catoctin Creek, as taken from the 2014 Integrated Report:

Class III, Section 10b.

DEQ monitoring stations located in this segment of the South Fork Catoctin Creek:

- *biological monitoring station 1aSOC000.01, above the confluence with North Fork Catoctin Creek*
- *ambient monitoring station 1aSOC001.66, at Route 698*
- *ambient monitoring station 1aSOC005.46, at Route 9*

E. coli monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. The E. coli data collected by the citizen monitoring group indicate that a water quality issue may exist for the recreation use; however, the methodology and/or data quality has not been approved for such a determination. A fecal coliform TMDL for the South Fork Catoctin Creek watershed has been completed and approved.

Biological and associated chemical monitoring finds this segment to be supporting the aquatic life use. Citizen monitoring indicates a low probability of adverse conditions for biota. The wildlife use is considered fully supporting. The fish consumption use was not assessed.

b. 303(d) Listed Stream Segments and Total Maximum Daily Loads (TMDLs)

TABLE 3
INFORMATION ON DOWNSTREAM 303(D) IMPAIRMENTS AND TMDLS

Waterbody Name	Impaired Use	Cause	Distance From Outfall	TMDL completed	WLA	Basis for WLA	TMDL Schedule
Impairment Information in the 2014 Integrated Report							
South Fork Catoctin Creek	Recreation	*E. coli*	1.66 miles	Catoctin Creek Bacteria 05/31/2002	2.49E+10 cfu/year fecal coliform bacteria* 1.57E+10 cfu/year *E. coli*†	200 cfu/100 ml fecal coliform 126 cfu/100 ml *E. coli* --- 0.009 MGD	---

* The WLA is expressed in the Catoctin Creek Bacteria TMDL as cfu/year fecal coliform bacteria.

† This facility is new and did not receive a WLA as part of the Catoctin Creek Bacteria TMDL that was approved by EPA in 2002. The Catoctin Creek TMDL did not include a future growth allocation, and future growth was not modeled as part of the original TMDL. The WLA for this facility was determined in accordance with DEQ Guidance Memo 14-2015 and Part A of the Water Quality Management Regulation, which allow the total WLA for a bacteria TMDL to be increased through DEQ tracking without a TMDL modification provided permits added to the WLA are consistent with water quality standards for bacteria and the TMDL watershed is not effluent dominated.

Significant portions of the Chesapeake Bay and its tributaries are listed as impaired on Virginia's 303(d) list of impaired waters for not meeting the aquatic life use support goal. The draft 2012 Virginia Water Quality Assessment 305(b)/303(d) Integrated Report indicates that much of the mainstem Bay does not fully support this use support goal under Virginia's Water Quality Assessment guidelines. Nutrient enrichment is cited as one of the primary causes of impairment. EPA issued the Bay TMDL on December 29, 2010. It was based, in part, on the Watershed Implementation Plans developed by the Bay watershed states and the District of Columbia.

The Chesapeake Bay TMDL addresses all segments of the Bay and its tidal tributaries that are on the impaired waters list. As with all TMDLs, a maximum aggregate watershed pollutant loading necessary to achieve the Chesapeake Bay's water quality standards has been identified. This aggregate watershed loading is divided among the Bay states and their major tributary basins, as well as by major source categories [wastewater, urban storm water, onsite/septic agriculture, air deposition]. Fact Sheet Section 17.e provides additional information on specific nutrient limitations for this facility to implement the provisions of the Chesapeake Bay TMDL.

The full planning statement is found in **Attachment 5**.

c. Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, UT of South Catoctin Creek, is located within Section 10b of the Potomac River Basin and classified as Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32° C and maintain a pH of 6.0 – 9.0 standard units (S.U.).

The Freshwater Water Quality/Wasteload Allocation Analyses located in **Attachment 6a/6b** details other water quality criteria applicable to the receiving stream. This facility has a tiered design flow of 0.0045 MGD and 0.009 MGD. A Freshwater Water Quality/Wasteload Allocation Analysis was completed for each flow tier.

Some Water Quality Criteria are dependent on the pH, temperature and total hardness of the receiving stream and/or final effluent. These values were utilized to determine the criterion found in **Attachment 6a/6b** for the following pollutants: Ammonia.

pH and Temperature for Ammonia Criteria

The fresh water, aquatic life Water Quality Criteria for ammonia is dependent on the instream pH and temperature. Since the effluent may have an impact on the instream values, the pH and temperature values of the effluent must also be considered when determining the ammonia criteria for the receiving stream. The 90th percentile pH and temperature values are utilized because they best represent the critical conditions of the receiving stream.

Ambient water quality data for waterbody VAN-A02R were available and are presented in **Attachment 7**. The 90th percentile annual and wet season temperature values are 23.1 °C and 12.7 °C, the 90th percentile and 10th percentile maximum pH values are 8.0 S.U and 7.0 S.U.

This facility has not been built; therefore there is no effluent data available. A default temperature value of 25º C and an assumed temperature value of 15° C for summer and winter, respectively, were utilized since effluent data was not readily available.

A default effluent pH value of 8.0 S.U. was assumed for the 90th percentile maximum.

The ammonia water quality criteria calculations for each flow tier are shown in **Attachment 8**.

Hardness Dependent Metals Criteria

The Water Quality Criteria for some metals are dependent on the receiving stream and/or effluent total hardness values (expressed as mg/L calcium carbonate).

There is no hardness data available for this effluent. Staff guidance suggests utilizing a default hardness value of 50 mg/L $CaCO_3$ for streams east of the Blue Ridge. This default hardness value was utilized for the effluent. Ambient hardness data for waterbody VAN-A02R were available and are presented in **Attachment 7**. The average hardness for VAN-A02R is 63.8 mg/L calcium carbonate.

The hardness dependent metals criteria in **Attachment 6a/6b** are based on this default value.

Bacteria Criteria

The Virginia Water Quality Standards at 9VAC25-260-170A state that the following criteria shall apply to protect primary recreational uses in surface waters:

E. coli per 100 mL of water shall not exceed the following:

	Geometric Mean[1]
Freshwater *E. coli* (N/100 mL)	126

[1]For a minimum of four weekly samples taken during any calendar month

d. Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, UT to South Fork Catoctin Creek, is located within Section 10b of the Potomac River Basin. This section has not been designated with a special standard.

e. Threatened or Endangered Species

The Virginia DGIF Fish and Wildlife Information System Database was searched on 22 April 2016 for records to determine if there are threatened or endangered species in the vicinity of the discharge. The following threatened or endangered species were identified within a 2 mile radius of the discharge: Dwarf Wedgemussel *(Alasmidonta heterodon*), Northern Long-Eared Bat *(Myotis septentrionalis),* Brook Floater *(Alasmidonta varicose),* Little Brown Bat *(Myotis lucifugus lucifugus),* Tri-

colored Bat *(Perimyotis subflavus),* Wood Turtle *(Glyptemys insculpta),* Peregrine Falcon *(Falco peregrinus),* Loggerhead Shrike *(Lanius ludovicianus),* Henslow's Sparrow *(Ammodramus henslowii),* Green Floater *(Lasmigona subviridis),* Migrant Loggerhead Shrike *(Lanius ludovicianus migrans),* Regal Fritillary *(Speyeria idalia idalia),* Bald Eagle *(Haliaeetus leucocephalus),* Dotted Skipper *(Hesperia attalus slossonae),* Yellow Lance *(Elliptio lanceolata),* Spotted Turtle *(Clemmys guttata),* Timber Rattlesnake *(Crotalus horridus).* The limits proposed in this draft permit are protective of the Virginia Water Quality Standards and protect the threatened and endangered species found near the discharge.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

It is staff's best professional judgement that the receiving stream be classified as Tier 1 based on the following: (1) the stream critical flows have been determined to be zero; and (2) at times the stream flow may be comprised of only effluent.

The proposed permit limits have been established by determining wasteload allocations which will result in attaining and/or maintaining all water quality criteria which apply to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points are equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLA) are calculated. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are the calculated on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

a. Effluent Screening

This facility has not been built; therefore no effluent data could be obtained. Since the facility will be treating domestic sewage, it can be assumed that Ammonia as N will require a wasteload allocation analysis.

b. Mixing Zones and Wasteload Allocations (WLAs)

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria.

The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o [Q_e + (f) (Q_s)] - [(C_s) (f) (Q_s)]}{Q_e}$$

Where:
- WLA = Wasteload allocation
- C_o = In-stream water quality criteria
- Q_e = Design flow
- Q_s = Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; harmonic mean for carcinogen-human health criteria; 30Q10 for ammonia criteria; and 30Q5 for non-carcinogen human health criteria)
- f = Decimal fraction of critical flow
- C_s = Mean background concentration of parameter in the receiving stream.

While the water segment receiving the discharge via Outfall 001 is considered to have a 7Q10 and 1Q10 of 0.0 MGD, the wet season critical flows are greater than 0.0 MGD. Therefore, the Water Quality Standards mixing zone requirements must be considered when developing permit limitations.

The Water Quality Standards contain two distinct mixing zone requirements. The first requirement is general in nature and requires the "use of mixing zone concepts in evaluating permit limits for acute and chronic standards in 9VAC25-260-140.B". The second requirement is specific and establishes special restrictions for regulatory mixing zones "established by the Board".

The Department of Environmental Quality uses a simplified mixing model to estimate the amount of mixing of a discharge with the receiving stream within specified acute and chronic exposure periods. The simplified model contains the following assumptions and approximations:

- The effluent enters the stream from the bank, either via a pipe, channel or ditch.
- The effluent velocity isn't significantly greater (no more than 1 - 2 ft/sec greater) than the stream velocity.
- The receiving stream is much wider than its depth (width at least ten times the depth).
- Diffusive mixing in the longitudinal direction (lengthwise) is insignificant compared with advective transport (flow).
- Complete vertical mixing occurs instantaneously at the discharge point. This is assumed since the stream depth is much smaller than the stream width.
- Lateral mixing (across the width) is a linear function of distance downstream.
- The effluent is neutrally buoyant (e.g. the effluent discharge temperature and salinity are not significantly different from the stream's ambient temperature and salinity).
- Complete mix is determined as the point downstream where the variation in concentration is 20% or less across the width and depth of the stream.
- The velocity of passing and drifting organisms is assumed equal to the stream velocity.

Staff derived wasteload allocations where parameters are reasonably expected to be present in an effluent (e.g., total residual chlorine where chlorine is used as a means of disinfection) and where effluent data indicate the pollutant is present in the discharge above quantifiable levels. With regard to the Outfall 001 discharge, ammonia as N is likely present since this is a wastewater treatment plant treating sewage. As such, **Attachment 9** details the mixing analysis results for the wet season and **Attachment 6a/6b** details the WLA derivations for these pollutants.

c. Effluent Limitations, Outfall 001 – Toxic Pollutants

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Ammonia as N/TKN

DEQ guidance suggests using a sole data point of 9.0 mg/L to ensure the evaluation adequately addresses the potential ammonia in a discharge containing domestic sewage. Staff used this data point to determine new ammonia water quality criteria, new wasteload allocations (WLAs) and new ammonia limits (**Attachment 8**). A reasonable potential analysis suggested an ammonia limit of 2.5 mg/L (**Attachment 8**).

The toxicity of ammonia is dependent on the pH of the effluent and/or receiving stream. Ammonia can exist as both "ionized ammonia" (NH_4) and "un-ionized ammonia" (NH_3). Research has shown that the un-ionized ammonia is the fraction that is toxic to aquatic life while the ionized ammonia has been found to have little or no toxic effect. Furthermore, it has been demonstrated that the un-ionized fraction increases correspondingly with rising pH values; thus, increasing potential toxicity and the basis for the above calculated ammonia limits.

It is generally accepted that total Kjeldahl nitrogen (TKN) consists of approximately 60% ammonia in raw wastewater. As the waste stream is treated, the ammonia component of TKN is converted to nitrate (NO_3) and nitrite (NO_2). It is estimated that a facility achieving a TKN limit of 3.0 mg/L essentially removes ammonia from the waste stream, resulting in a 'self-sustaining' quality effluent that protects against ammonia toxicity.

The facility will be given a year round total Kjeldahl nitrogen (TKN) limit of 3.0 mg/L. A TKN limit of 3.0 mg/L assumes that ammonia is removed and that the remaining nitrogen is in the form of refractory organic compounds that will not be easily oxidized. The weekly average limit will be 4.5 mg/L based on a multiplier of 1.5 times the monthly average.

The Environmental Protection Agency (EPA) finalized new, more stringent ammonia criteria in August 2013; possibly resulting in significant reductions in ammonia effluent limitations. It is staff's professional judgment that the incorporation of those criteria into the Virginia Water Quality Standards is forthcoming. This and many other facilities may be required to comply with these new criteria during their next respective permit terms. The ammonia criteria will be revisited during the next reissuance.

2) Metals/Organics

No metals or organics data were available for review; therefore, no effluent limits are proposed.

d. Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

Dissolved oxygen (D.O.), carbonaceous biochemical oxygen demand-5 day ($cBOD_5$), total suspended solids (TSS), total Kjeldahl nitrogen (TKN) and pH limitations are proposed.

$cBOD_5$, TSS, D.O. and TKN limitations are based on professional judgement and the current VPDES Permit Manual. These limits are applicable to waters, such as this portion of the unnamed tributary to South Fork Catoctin Creek, where the water is shallow, flow is intermittent and the waters cannot be modeled.

TKN limitations based are also protective of the ammonia water quality criteria (**Attachment 6a/6b**).

It is staff's practice to equate the total suspended solids limits with the $cBOD_5$ limits since the two pollutants are closely related in terms of treatment of domestic sewage.

pH limitations are set at the water quality criteria.

E. coli limitations are in accordance with the Water Quality Standards 9VAC25-260-170 and the Catoctin Creek Bacteria TMDL.

e. Effluent Annual Average Limitations and Monitoring, Outfall 001 – Nutrients

VPDES Regulation 9VAC25-31-220(D) requires effluent limitations that are protective of both the numerical and narrative water quality standards for state waters, including the Chesapeake Bay.

Pursuant to § 62.1-44.19:15, an owner or operator of a facility treating domestic sewage authorized by a VPDES permit with a discharge of 1,000 gallons per day up to and including 39,999 gallons per day that has not commenced the discharge of pollutants prior to January 1, 2011, shall demonstrate that the facility has acquired WLAs sufficient to offset the delivery of total nitrogen and total phosphorus loads prior to commencing discharge.

Because this facility had zero allocation for total nitrogen and/or total phosphorus loadings, an offset plan was provided to DEQ during the drafting of this permit and shall be included in the *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation For Total Nitrogen And Total Phosphorus Discharges And Nutrient Trading In The*

Chesapeake Bay Watershed.

According to the Nutrient Credit Agreement (**Attachment 10**), beginning January 1, 2017 and lasting until December 31, 2021, Loudoun County Milling Inc. has obtained 274 lb/year of total nitrogen credits and 27 lb/year of total phosphorus credits from the Town of Leesburg (VA0092282).

The offset plan is subject to a DEQ approved trading contract prepared in accordance with 62.1-44.19:12 - :19 of the Law and 9VAC25-820-10 et seq., and which includes, but not limited to, the following:

1) Discussion of the source of the acquired allocations;

2) Discussion of other permitted facilities involved in the trade; and

3) Discussion of any non-point source allocations acquired.

As discussed in Section 15, significant portions of the Chesapeake Bay and its tributaries are listed as impaired with nutrient enrichment cited as one of the primary causes. Virginia has committed to protecting and restoring the Bay and its tributaries. There are three regulations that necessitate the inclusion of nutrient limitations for new dischargers that were not accounted for in the TMDL:

1) 9VAC25-40 – *Regulation for Nutrient Enriched Waters and Dischargers within the Chesapeake Bay Watershed* requires new or expanding discharges with design flows of ≥ 0.04 MGD to treat for total nitrogen (TN) and total phosphorus (TP) to either Biological Nitrogen Removal (BNR) levels (TN = 8 mg/L; TP = 1.0 mg/L) or State of the Art SOA levels (TN = 3.0 mg/L and TP = 0.3 mg/L).

   Furthermore, as specified in 9VAC25-40-70., *Strategy for the Chesapeake Bay Watershed*, technology-based effluent concentration limits shall be included in the individual permit for any facility that has installed technology for the control of nitrogen and phosphorus whether by new construction, expansion, or upgrade. Such limitations shall be based upon the technology installed by the facility and shall be expressed as annual average concentrations.

2) 9VAC25-720 – *Water Quality Management Plan Regulation* sets forth total nitrogen and total phosphorus maximum wasteload allocations for facilities designated as significant discharges, i.e. those with design flows of ≥ 0.5 MGD above the fall line and ≥ 0.1 MGD below the fall line. This regulation limits the total nitrogen and total phosphorus mass loadings from these discharges.

3) 9VAC25-820 – *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia* became effective January 1, 2007. This regulation specifies and controls the nitrogen and phosphorus loadings from facilities and specifies facilities that must register under the general permit. Nutrient loadings for those facilities registered under the general permit as well as compliance schedules and other permit requirements, shall be authorized, monitored, limited and otherwise regulated under the general permit and not this individual permit. This facility has coverage under this General Permit; the permit number is VAN010174.

According to Guidance Memo No. 07-2008, Amendment No. 2, discharges from new facilities with design flows <0.04 MGD must be evaluated with regard to E3/E4 participations, currently installed technology, federal effluent guidelines or local water quality considerations irrespective of status, design flow or location. Technology based concentration limits for new facilities are 8.00 mg/L TN and 1.00 mg/L TP for facilities installing BNR and 3.00 mg/L TN and 0.30 mg/L TP for facilities installing SOA.

As mentioned in Section 10, this facility will serve as a mixed-use commercial property. The property will likely generate wastewater from a limited amount of sources. Furthermore, wastewater will only be generated during operational hours of the facility. Due to the previously mentioned items and the design flow of the system being so small, it is staff's professional judgement that BNR limits of 8.00 mg/L TN and 1.00 mg/L TP be included with this permit.

Monitoring for nitrates + nitrites and limits for total Kjeldahl nitrogen, total nitrogen and total phosphorus are included in this permit. The monitoring and limits are needed to protect the Chesapeake Bay Water Quality Standards. Frequencies are set at the frequencies set forth in 9VAC25-820. Annual average effluent limitations, as well as monthly and year to date calculations for total nitrogen and total phosphorus are included in this individual permit. The annual averages are based on

9VAC25-40 and GM07-2008.

f. Effluent Limitations and Monitoring Summary

The effluent limitations are presented in Section 19. Limits were established for carbonaceous biochemical oxygen demand-5 day ($cBOD_5$), total suspended solids (TSS), total Kjeldahl nitrogen (TKN), pH, *E. coli*, total nitrogen (calendar year), total phosphorus (calendar year), and dissolved oxygen (D.O.). Monitoring and reporting for flow and nitrate+nitrite are also included.

The limit for total suspended solids is based on Professional Judgment.

The mass loading (kg/d) for monthly and weekly averages were calculated by multiplying the concentration values (mg/L), with the flow values (in MGD) and then a conversion factor of 3.785.

The mass loading (lb/d) for TKN and total phosphorus monthly and weekly averages were calculated by multiplying the concentration values (mg/L), with the flow values (in MGD) and then a conversion factor of 8.345.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual.

The VPDES Permit Regulation at 9VAC25-31-30 and 40 CFR Part 133 require that the facility achieve at least 85% removal for cBOD and TSS (or 65% for equivalent to secondary). The limits in this permit are technology based effluent limits and result in greater than 85% removal.

18. Antibacksliding:

GM No.00-2011 defines backsliding as issuing or modifying a VPDES permit to have less stringent limits for a pollutant than the existing permit. This permit will be the first time limits are derived for this discharge, therefore backsliding does not apply.

19. Effluent Limitations/Monitoring Requirements:

a. Design flow is 0.0045 MGD.

Effective Dates: During the period beginning with the permit's effective date and lasting until either the expiration date or the issuance of the CTO for the 0.009 MGD facility, whichever occurs first.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/D	Estimate
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
$cBOD_5$	3,5	10 mg/L 0.17 kg/day	15 mg/L 0.25 kg/day	NA	NA	1/M	Grab
Total Suspended Solids (TSS)	2	10 mg/L 0.17 kg/day	15 mg/L 0.25 kg/day	NA	NA	1/M	Grab
Dissolved Oxygen (DO)	3,5	NA	NA	6.0 mg/L	NA	1/D	Grab
E. coli (Geometric Mean) [a.]	3,7	126 n/100mL	NA	NA	NA	1/W	Grab
Total Kjeldahl Nitrogen (TKN)	3,5	3.0 mg/L 0.11 lb/day	4.5 mg/L 0.17 lb/day	NA	NA	1/M	Grab
Nitrate+Nitrite, as N	3,6	NL mg/L	NA	NA	NA	1/M	Grab
Total Nitrogen [b.]	3,6	NL mg/L	NA	NA	NA	1/M	Calculated
Total Nitrogen – Year to Date [c.]	3,6	NL mg/L	NA	NA	NA	1/M	Calculated
Total Nitrogen – Calendar Year [c.]	3,6	8.0 mg/L	NA	NA	NA	1/YR	Calculated
Total Phosphorus	3,6	NL mg/L	NA	NA	NA	1/M	Grab
Total Phosphorus – Year to Date [c.]	3,6	NL mg/L	NA	NA	NA	1/M	Calculated
Total Phosphorus – Calendar Year [c.]	3,6	1.0 mg/L	NA	NA	NA	1/YR	Calculated

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Professional Judgment
3. Water Quality Standards
4. DEQ Disinfection Guidance
5. VPDES Permit Manual
6. 9VAC25-40 (Nutrient Regulation)
7. Catoctin Creek Bacteria TMDL

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.

1/D = Once every day.
1/W = Once every week.
1/M = Once every month.
1/YR = Once every calendar year.

Grab = An individual sample collected over a period of time not to exceed 15 minutes.
Estimate = Reported flow is to be based on the technical evaluation of the sources contributing to the discharge.

a. Samples shall be collected between 10:00 a.m. and 4:00 p.m.

b. Total Nitrogen = Sum of TKN plus Nitrate+Nitrite

c. See Section 20 for more information on the Nutrient Calculations.

19. Effluent Limitations/Monitoring Requirements:

b. Design flow is 0.009 MGD.

Effective Dates: During the period beginning with the issuance of the CTO for the 0.009 MGD facility and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/D	Estimate
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
$cBOD_5$	3,5	10 mg/L 0.34 kg/day	15 mg/L 0.51 kg/day	1/M	NA	1/M	Grab
Total Suspended Solids (TSS)	2	10 mg/L 0.34 kg/day	15 mg/L 0.51 kg/day	1/M	NA	1/M	Grab
Dissolved Oxygen (DO)	3,5	NA	NA	6.0 mg/L	NA	1/D	Grab
E. coli (Geometric Mean) [a.]	3,7	126 n/100mL	NA	NA	NA	1/W	Grab
Total Kjeldahl Nitrogen (TKN)	3,5	3.0 mg/L 0.22 lb/day	4.5 mg/L 0.34 lb/day	NA	NA	1/M	Grab
Nitrate+Nitrite, as N	3,6	NL mg/L	NA	NA	NA	1/M	Grab
Total Nitrogen [b.]	3,6	NL mg/L	NA	NA	NA	1/M	Calculated
Total Nitrogen – Year to Date [c.]	3,6	NL mg/L	NA	NA	NA	1/M	Calculated
Total Nitrogen – Calendar Year [c.]	3,6	8.0 mg/L	NA	NA	NA	1/YR	Calculated
Total Phosphorus	3	NL mg/L	NA	NA	NA	1/M	Grab
Total Phosphorus – Year to Date [c.]	3,6	NL mg/L	NA	NA	NA	1/M	Calculated
Total Phosphorus – Calendar Year [c.]	3,6	1.0 mg/L	NA	NA	NA	1/YR	Calculated

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Professional Judgment
3. Water Quality Standards
4. DEQ Disinfection Guidance
5. VPDES Permit Manual
6. 9VAC25-40 (Nutrient Regulation)
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1/M = Once every month.
1/YR = Once every calendar year.

Grab = An individual sample collected over a period of time not to exceed 15 minutes.
Estimate = Reported flow is to be based on the technical evaluation of the sources contributing to the discharge.

a. Samples shall be collected between 10:00 a.m. and 4:00 p.m.

b. Total Nitrogen = Sum of TKN plus Nitrate+Nitrite

c. See Section 20.a. for more information on the Nutrient Calculations.

20. Other Permit Requirements:

Part I.B. of the Permit Contains Quantification Levels and Compliance Reporting Instructions.

The calculations for the nitrogen and phosphorus parameters shall be in accordance with the calculations set forth in 9VAC25-820 – *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia*. §62.1-44.19:13 of the Code of Virginia defines how annual nutrient loads are to be calculated; this is carried forward in 9VAC25-820-70. As annual concentrations (as opposed to loads) are limited in the individual permit, these reporting calculations are intended to reconcile the reporting calculations between the permit programs, as the permittee is collecting a single set of samples for the purpose of ascertaining compliance with two permits**.**

9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an instream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

21. Other Special Conditions:

a. 95% Capacity Reopener. The VPDES Permit Regulation at 9VAC25-31-200.B.4 requires all POTWs and PVOTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. This facility is a PVOTW.

b. Indirect Dischargers. Required by VPDES Permit Regulation, 9VAC25-31-200.B.1 and B.2 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

c. Operations and Maintenance Manual Requirement. Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. The permittee shall develop and maintain a current Operations and Maintenance (O&M) Manual. The permittee shall operate the treatment works in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

d. Certificate to Construct/Certificate to Operate Requirement. The Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790 requires that all treatment works treating wastewater obtain a Certificate to Construct (CTC) prior to commencing construction and to obtain a Certificate to Operate (CTO) prior to commencing operation of the treatment works.

e. Licensed Operator Requirement. The Code of Virginia at §54.1-2300 et seq. and the VPDES Permit Regulation at 9VAC25-31-200.C., and by the Board for Waterworks and Wastewater Works Operators and Onsite Sewage System Professionals Regulations (18VAC160-20-10 et seq.) requires licensure of operators. This facility requires a Class III operator.

f. Reliability Class. The Sewage Collection and Treatment Regulations at 9VAC25-790 require sewage treatment works to achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. Reliability means a measure of the ability of the treatment works to perform its designated function without failure or interruption of service. The facility is required to meet a reliability Class of II.

g. Water Quality Criteria Reopener. The VPDES Permit Regulation at 9VAC25-31-220.D. requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.

h. Sludge Reopener. The VPDES Permit Regulation at 9VAC25-31-220.C. requires all permits issued to treatment works treating domestic sewage (including sludge-only facilities) include a reopener clause allowing incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the CWA. The facility includes a sewage treatment works.

i. Sludge Use and Disposal. The VPDES Permit Regulation at 9VAC25-31-100.P; 220.B.2, and 420 through 720 and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. The facility includes a treatment works treating domestic sewage.

j. Nutrient Offsets. The Virginia General Assembly, in their 2005 session, enacted a new Article 4.02 (Chesapeake Bay Watershed Nutrient Credit Exchange Program) to the Code of Virginia to address nutrient loads to the Bay. Section 62.1-44.19:15 sets forth the requirements for new and expanded dischargers, which are captured by the requirements of the law, including the requirement that non-point load reductions acquired for the purpose of offsetting nutrient discharges be enforced through the individual VPDES permit.

k. E3/E4. 9VAC25-40-70.B. authorizes DEQ to approve an alternate compliance method to the technology-based effluent concentration limitations as required by subsection A of this section. Such alternate compliance method shall be incorporated into the permit of an Exemplary Environmental Enterprise (E3) facility or an Extraordinary Environmental Enterprise (E4) facility to allow the suspension of applicable technology-based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system that includes operation of installed nutrient removal technologies at the treatment efficiency levels for which they were designed.

l. Nutrient Reopener. 9VAC25-40-70.A. authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade. 9VAC25-31-390.A. authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

m. Notification of Commencement of Discharge. The submittal of Discharge Monitoring Reports is delayed until such time that a Certificate to Operate for the facility has been issued. It also requires the permittee to enroll in the DEQ's electronic Discharge Monitoring Report (e-DMR) system at the time of submittal for the Certificate to Operate.

n. Total Maximum Daily Load (TMDL) Reopener. Section 303(d) of the Clean Water Act requires that Total Maximum Daily Loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream.

22. Permit Section Part II.

Required by VPDES Regulation 9VAC25-31-190, Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. Variances/Alternate Limits or Conditions:

Not Applicable.

24. Public Notice Information:

First Public Notice Date: TBD Second Public Notice Date: TBD

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected and copied by contacting the: DEQ Northern Regional Office; 13901 Crown Court; Woodbridge, VA 22193; Telephone No. (703) 583-3859, caitlin.shipman@deq.virginia.gov. See **Attachment 11** for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for

public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

25. Additional Comments:

Previous Board Action(s):	Not Appicable.
Staff Comments:	Drafting of this permit was delayed while the permittee obtained nutrient credits and applied for coverage under the General Permit for *Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia*.
State/Federal Agency Comments:	Per correspondence on May 24, 2016, Virginia Department of Health (VDH) had no objections to the issuance of this permit and recommended a Reliability Class II for this facility.
Public Comments:	
Owner Comments:	